REMARKS

Applicants were advised in the office action of 4 November 2002 that:

a) Claims 1, 4, 5, 9, 14, and 15 are finally rejected under 35 U.S.C. 102(b) as being anticipated by Strobl (U.S. Patent No. 5,360,274);

b) Claims 1, 4-6, 9, 14, and 15 are finally rejected under 35 U.S.C. 102(b) as being anticipated by Winkelmann (U.S. Patent No. 3,770,990); and

c) Claims 2, 3, 7, 8 and 10-13 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Strobl (U.S. Patent No. 5,360,274) in view of Rose (U.S. Patent No. 3,239,287).

In view of the comments below applicant respectively requests that the examiner reconsider rejected claims 2-5, 7, 8, and 11-15. No new matter has been added with any of the amendments to the claims. In compliance with 37 C.F.R. §1.121 and for the Examiner's convenience the Applicants have enclosed a marked up copy of the claims showing any material added or deleted.

Claims 2, 7 and 11 have been rewritten in independent form by this amendment. None of the cited references, alone or in combination, show or suggest the features of claims 2, 7 and 11. That is, none of the cited references show or suggest the fixing surfaces that allow radial and relative movement for adjusting axial alignment among the first and second members and the bearing, when the fixing surfaces come in contact with each other in advance for sandwiching the bearing between the holding surfaces. This feature is important because it causes the spherical bearing to be uniformly pressed by the first and second members after the first and second members are fixed. That is, there are no uneven forces applied to the bearing by the bearing holder due to the self-alignment that occurs prior to the time that the fixing members are fixed to one another. Thus, claims 2, 7, and 11 and their dependents are believed to be patentable.

In the patent to Strobl, the outer periphery of the retainer 9 is press-fitted to the inner circumference of the housing 6, which fixes the position of the axis of the retainer relative to the axis of the bearing. Thus, there is no self-alignment occurring before the retainer is fixed, unlike the present invention. If the retainer is misaligned, the force applied to the bearing by the retainer will be uneven.

In the patent to Winklemann, the outer periphery of the retainer 34 is fixed by abutment with the housing 34, which fixes the position of the axis of the retainer 34 relative to the axis of the bearing. Thus, there is no self-alignment occurring before the retainer 34 is fixed, unlike the present invention. If the retainer 34 is misaligned, the force applied to the bearing by the retainer 34 will be uneven.

In the patent to Rose, the fingers 42 are snapped into engagement with the plate 16 through the holes 48, which fixes the position of the collar 36. Thus, again, there is no self-alignment occurring before the collar 36 is fixed, unlike the present invention. If the collar is misaligned, the force applied to the bearing by the retainer will be uneven.

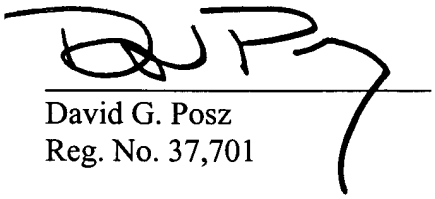
In the remarks section of the final rejection, the examiner questioned the use of the phrase "line contact" in the arguments. This refers to the contact between the spherical bearing 7 and the tapered holding surface 5c. Such contact defines a circle, which was referred to as "line contact" to distinguish it from surface contact.

No new issues are raised by this amendment, since claims are either being canceled or written in independent form. Therefore, entry of this amendment is respectfully requested.

Applicants respectfully submit that the claims, as amended, clearly and patentably distinguish over the cited references of record and as such are to be deemed allowable. Such allowance is hereby earnestly and respectfully solicited at an early date. If the Examiner has any suggestions or comments or questions, calls are welcomed at the phone number below.

Although it is not anticipated that any fees are due or payable, the Commissioner is hereby authorized to charge any fees that may be required to Deposit Account No. **50-1147**.

Respectfully submitted,



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MARKED UP VERSION OF SPECIFICATION AND CLAIMS

IN THE CLAIMS

Please cancel claims 1, 6, 9 and 10.

Please amend claims 2, 4, 7, 11, 12, 13 and 14 as follows:

1. (Canceled) A bearing holding structure comprising;

a bearing whose outer circumferential surface is formed in a spherical shape, and

first and second members having holding surfaces which extend axially in opposite directions to each other and between which the bearing is sandwiched, each of the holding surfaces being tapered axially to expand straight toward the opposing holding surface.

2. (Once Amended) A bearing holding structure comprising;

a bearing whose outer circumferential surface is formed in a spherical shape, and

first and second members having holding surfaces which extend axially in opposite directions to each other and between which the bearing is sandwiched, each of the holding surfaces being tapered axially to expand straight toward the opposing holding surface[A bearing holding structure according to claim 1], wherein the first and second members have fixing surfaces which extend radially from the holding surfaces, respectively, and allow [a] radial and relative movement for adjusting an axial alignment among the first and second members and the bearing, when the fixing surfaces come in contact with each other in advance for sandwiching the bearing between the holding surfaces, and[, then,] wherein the fixing surfaces are fixed to each other to inhibit the radial and relative movement so that first and second members rigidly hold the bearing.

3. (Unchanged) A bearing holding structure according to claim 2, wherein one of the fixing surfaces is provided with at least a projection and another of the fixing surfaces is provided with at least an aperture, the projection being engaged with the aperture so as to be able to slightly move therein, when the fixing surfaces come in contact with each other in advance, and, then, being deformed partly after having secured the axial alignment so that the fixing surfaces are fixed to each other.

4. (Once Amended) A bearing holding structure according to claim [1] 2, wherein at least one of the holding surfaces is provided with biasing means for urging the bearing against the opposing holding surface.

5. (Unchanged) A bearing holding structure according to claim 4, wherein the biasing means is a plurality of elastically deformable pieces formed circumferentially by cutting radially at given angular intervals and raising in one direction a part of the first and second members corresponding to the one of the holding surfaces.

6. (Canceled) A motor comprising:

a cylinder-shaped yoke having an opening at an axial end thereof;

a plurality of magnets fixed to an inner circumference of the yoke;

a rotor disposed in a space of the yoke on an inner side of the magnets;

an end plate fixed to the opening, the end plate having an axially outwardly extending holding surface;

a bearing disposed in a center of the end plate for rotatably holding the rotor, an outer circumferential surface of the bearing being formed in a spherical shape; and

a holding plate having axially inwardly extending holding surface, wherein the holding surfaces of the end and holding plates are opposed to each other so that the bearing is sandwiched therebetween and each of the holding surfaces is tapered axially to expand straight toward the opposing holding surface.

7. (Once Amended) A motor comprising:

a cylinder-shaped yoke having an opening at an axial end thereof;

a plurality of magnets fixed to an inner circumference of the yoke;

a rotor disposed in a space of the yoke on an inner side of the magnets;

an end plate fixed to the opening, the end plate having an axially outwardly extending holding surface;

a bearing disposed in a center of the end plate for rotatably holding the rotor, wherein an outer circumferential surface of the bearing is spherical; and

a holding plate having axially inwardly extending holding surface, wherein the holding surfaces of the end plate and the holding plate are opposed to each other so that the bearing is sandwiched between the end plate and the holding plate, and each of the holding surfaces is tapered axially to expand straight toward the opposing holding surface [A motor according to claim 6], wherein the end and holding plates have fixing surfaces

which extend radially from the holding surfaces, respectively, and allow a radial and relative movement to adjust an axial alignment among the end and holding plates and the bearing, when the fixing surfaces come in contact with each other in advance for sandwiching the bearing between the holding surfaces and, then, are fixed to each other to inhibit the radial and relative movement so that the end and holding plates hold the bearing.

8. (Unchanged) A motor according to claim 7, wherein one of the fixing surfaces is provided with at least a projection and another of the fixing surfaces is provided with at least an aperture, the projection being engaged with the aperture so as to be able to slightly move therein, when the fixing surfaces come in contact with each other in advance, and, then, is partly deformed after having secured the axial alignment so that the fixing surfaces are fixed to each other.

9. (Canceled) A method of holding a bearing that is self aligning, the method comprising:

providing a first member and a second member having holding surfaces which extend axially in opposite directions to each other, each of the holding surfaces being tapered axially to expand straight toward the opposing holding surface; and

sandwiching the bearing between the holding surfaces of the first member and the second member.

10. (Canceled) The method of holding a bearing of claim 9 wherein the first member and second member further have fixing surfaces which extend radially from the holding surfaces, the method further including;

moving the first member and the second member toward each other until the fixing surfaces come in contact with each other, thereby performing the sandwiching the bearing, and

allowing a radial and relative movement of the first member and the second member for adjusting an axial alignment among the first member and the second member and the bearing.

11. (Once Amended) A method of holding a bearing that is self aligning, the method comprising:

providing a first member and a second member having holding surfaces, which extend axially in opposite directions to each other, each of the holding surfaces being tapered axially to expand straight toward the opposing holding surface; and

sandwiching the bearing between the holding surfaces of the first member and the second member, wherein the first member and second member further have fixing surfaces which extend radially from the holding surfaces, the method further including;

moving the first member and the second member toward each other until the fixing surfaces come in contact with each other, thereby performing the sandwiching, and

allowing a radial and relative movement of the first member and the second member for adjusting axial alignment of the first member and the second member and the bearing [The] , the method [of holding a bearing of claim 10] further including, when the fixing surfaces come in contact with each other and after the allowing a radial and relative movement of the first member and the second member, fixing the first member and the second member to each other to inhibit the radial and relative movement so that first and second members rigidly hold the bearing in alignment.

12. (Once Amended) The method of holding a bearing of claim [10] 11 further including [;] providing one of the fixing surfaces with at least a projection and another of the fixing surfaces with at least an aperture, the projection being engaged with the aperture so as to be able to move therein when the fixing surfaces come in contact with each other, thereby providing for the adjusting the axial alignment among the first member and the second member and the bearing.

13. (Once Amended) The method of holding a bearing of claim 12 further including [;] deforming the projection to secure the fixing surfaces to each other thus securing the axial alignment among the first member and the second member and the bearing.

14. (Once Amended) The method of holding a bearing of claim [9] 11 further including[;] providing at least one of the holding surfaces with biasing means for urging the bearing against the opposing holding surface.

15 (Unchanged) The method of holding a bearing of claim 14, wherein the providing at least one of the holding surfaces with biasing means further includes providing the biasing means as a plurality of elastically deformable pieces formed circumferentially by cutting radially at given angular intervals and raising in one direction a part of the first and second members corresponding to the one of the holding surfaces.